

CLAIMS

What is claimed is:

1. A semiconductor structure (1), comprising:
5 a isolation region (5) formed above a semiconductor material (10); and
a pillar (15) formed of the semiconductor material under the isolation region, where the pillar is capped with a first dielectric material (20) to form a void (16).
- 10 2. The semiconductor structure of claim 1, further comprising an electrical component (25) formed over the isolation region.
- 15 3. The semiconductor structure of claim 2, wherein the electrical component comprises a passive device or bonding pad.
4. The semiconductor structure of claim 1, wherein the
20 semiconductor material comprises monocrystalline silicon.
5. The semiconductor structure of claim 1, wherein the pillar is coated with a second dielectric material (21).
- 25 6. The semiconductor structure of claim 5, wherein the second dielectric material comprises thermally grown oxide or silicon nitride.
7. The semiconductor structure of claim 1, wherein the
30 first dielectric material comprises deposited silicon dioxide.
8. The semiconductor structure of claim 1, wherein the void (16) extends (17) at least five micrometers into the

semiconductor material.

9. A method of making a semiconductor structure (1),
comprising the steps of:

5 forming a pillar (15) of semiconductor material 10
under a isolation region of a semiconductor substrate 5 ;
and

capping the pillar with a first dielectric material
(20) to form a void (16).

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10. The method of claim 9, wherein the step of forming a
pillar further comprises the steps of:

removing semiconductor material from the semiconductor
substrate to form a cavity (18);

15 thermally oxidizing sidewalls (19) of the cavity to
form a layer of silicon dioxide (22,23,26); and

etching the layer of silicon dioxide leaving a pillar
(15) of the semiconductor material.

20 11. The method of claim 10, wherein the step of thermally
oxidizing comprises the step of consuming a portion (22) of
the semiconductor material.

25 12. The method of claim 9, wherein the first dielectric
material comprises deposited silicon dioxide.

13. The method of claim 9, wherein the semiconductor
material comprises silicon.

30 14. The method of claim 9, further comprising the step of
forming a passive component or bonding pad (25) over the
isolation region.

15. A semiconductor device (1), comprising:
an electrical component (25); and
5 a semiconductor substrate (10) having a isolation region (5) for forming the electrical component, where the isolation region includes a silicon pillar (15) extending into the semiconductor substrate.
- 10 16. The semiconductor device of claim 15, wherein the isolation region includes a cap layer (20) (12) formed on the silicon pillar.
17. The semiconductor device of claim 16, wherein the cap
15 layer forms a void (16) .
18. The semiconductor device of claim 16 wherein the silicon pillar extends at least five micrometers into (17) the semiconductor substrate.
- 20 19. The semiconductor device of claim 16 wherein the cap layer is comprised of deposited silicon dioxide or silicon nitride.
- 25 20. The semiconductor device of claim 15, wherein the electrical component is formed over the isolation region.
21. The semiconductor device of claim 20, wherein the electrical component comprises a passive device or bonding
30 pad of the semiconductor device.
22. The semiconductor device of claim 15, wherein the isolation region is formed with silicon dioxide.

23. A method of making a semiconductor device (1),
comprising the steps of:

5 forming silicon pillar (15, 27) under a isolation
region (5) of a semiconductor substrate (10) wherein the
silicon pillar is capped with a first dielectric material
(20) to form a void (16); and
 forming an electrical component (25) on the isolation
10 region.

24. The semiconductor device of claim 23, wherein the first
dielectric material comprises deposited silicon dioxide or
silicon nitride.

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25. The semiconductor device of claim 23, wherein the
electrical component comprises a passive device or bonding
pad.

20 26. The semiconductor device of claim 23, wherein the
isolation region is formed with silicon dioxide.

27. A semiconductor structure (1), comprising:

 a semiconductor substrate (10) having a recessed region
25 formed with a pillar; and

 a dielectric material disposed over the recessed region
and capping the pillar to form a void between the pillar and
a sidewall of the recessed region.

30 28. The semiconductor device of claim 27, wherein the
pillar is formed with a semiconductor material.

29. A method of making a semiconductor structure,
comprising the steps of:

- 5 oxidizing sidewalls of cavities in a semiconductor
material to form a continuous oxide layer between adjacent
cavities; and
 etching the continuous oxide layer to leave a pillar of
the semiconductor material.

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30. The method of claim 29, wherein the cavities are formed
in a region of the semiconductor material, further
comprising the step of depositing a dielectric material over
the region to form a void adjacent to the pillar.

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